IDENTIFYING DATA

Marine Pollution and Ecotoxicology

Subject	Marine Pollution and Ecotoxicology			
Code	V02M098V01206			
Study programme	(*)Máster Universitario en Bioloxía Mariña			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Optional	1st	2nd
Teaching language	Spanish			
Department				
Coordinator	García Estévez, José Manuel Barreiro Lozano, Rodolfo			
Lecturers	Barreiro Lozano, Rodolfo García Estévez, José Manuel Sánchez Marín, Paula			
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General description	This course explore techniques for detecting, quantifying and predicting the effects of pollutants in the marine environment. These techniques are essential for protecting and managing the environment against the risks of polllution.			

Competencies

Code	
A1	(*)Posuír e comprender coñecementos que acheguen unha base ou oportunidade de ser orixinais no desenvolvemento e/ou aplicación de ideas, adoito nun contexto de investigación.
A2	(*)Que os estudantes saiban aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en contornos novos ou pouco coñecidos dentro de contextos máis amplos (ou multidisciplinares) relacionados coa súa área de estudo.
B1	Utilización de criterios y métodos científicos en el planteamiento y resolución de problemas aplicando los conocimientos adquiridos
B4	Desarrollo de habilidades en el manejo y tratamiento de herramientas, matemáticas, estadísticas e informáticas
B6	Desarrollo de la curiosidad científica, de la iniciativa y la creatividad
C6	Conocimiento, identificación y evaluación de la calidad ambiental del medio marino y de la legislación vigente. Dirección de consultorías ambientales
D1	Desarrollo de las capacidades comprensivas, de análisis y síntesis
D2	Desarrollo de la capacidad de razonamiento crítico y autocrítico

Learning outcomes

Expected results from this subject	Training and Learning Results
Distinguishes and identifies the approaches of retrospective prospective ecotoxicology.	A1 A2 B1 C6
Describes the typical effects of the pollution on individuals, populations and communities	A1 A2 B1 C6

Assesses the advantages and limitations of each level of organisation to detect the impact of pollutants	A1 A2 B1 C6 D1 D2
Understands the fundamentals of ecotoxicology assays, bioaccumulation-dpuration studies and biomarkers	A1 A2 B4 D1 D2
Understands the relevance of the information provided by ecotoxicology assays	D1 D2
Understands the fundamentals and limitations of the predictions derived from models of the distribution and effects of pollutants	D1 D2
Is able to face the technical literature and place into context in the mainframe of ecotoxicology	B6 D1

Contents

Topic	
Introduction and bioaccumulation (Retrospective ecotoxicology I)	Main environmental problems. Ecotoxicology. The concept of bioavailability. Factors of pollutant bioavailability. Use of bioacumulators. Requirements of a good bioaccumulator
Toxicokinetics	Kineticsl of pollutant accumulation. Concepts of Bioconcentración Factor (BCF), Bioaccumulation Factor (BAF).
Biomagnification along the food chain	Concept of biomagnification. Estimating trophic transfer and Biomagnification Transfer. Examples of *biomagnification and trophic dilution
Physiological effects	Main physiological detrimental effects used in ecotoxicology and biomonitoring.
Biomarkers (Retrospective Ecotoxicology II).	Classification, specificity and relation with adverse effects. Requirements of a biomarker. Examples of biomarker.
Toxicity assays (Prospective Ecotoxicology *I).	Concentration-response relationship. Types of assay: acute and chronic toxicity. Data analyses. Toxicity curves. LC50, NOEC, LOEC and MATC.
Prediction in ecotoxicology (Prospective Ecotoxicology II)	Species sensitivity distribution. Environmental risk assessment.
Changes in community composition (Retrospective Ecotoxicology III).	Bioindicator species. Relative abundance. Biotic indexes. Diversity indexes. Comparison with communities of reference.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	16	40	56
Problem solving	4	12.5	16.5
Autonomous problem solving	1.5	0	1.5
Objective questions exam	1	0	1

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Lecturing	Master session
Problem solving	Computer sessions with specialized software.
Autonomous problem solving	Personal guidance to students through one-to-one meeting and/or using TICs.

Personalized assistance

Methodologies	Description
Autonomous problem solving	Personal guidance to students through one-to-one meeting and/or using TICs.

Assessment

	Description	Qualification	Training and Learning Results			
Objective questions exam	A test	100	A1 A2	B1 B4 B6	C6	D1 D2

Other comments on the Evaluation

Sources of information
Basic Bibliography
Complementary Bibliography
Newman, M. C., and M. A. Unger, **Fundamentals of Ecotoxicology**, 2,
Walker, C. H., S. P. Hopkin, R. M. Sibly, and D. B. Peakall., **Principles of Ecotoxicology**, 3,
Clark. R.B., **Marine Pollution**, 5,

Recommendations

Contingency plan

Description
=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of the uncertain and unpredictable evolution of the sanitary alert caused by the *COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide *antelación) by the students and the *profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===
Teaching methodologies that do not change:
-All (the subject is already taught using tele-teaching tools as it is part of an interuniversity master where a portion of the students are physically located at other universities.

* Educational methodologies that will change
-None. The only change will be the channel used to teach the classes as the videoconference system used under regular circumstances will be replaced by the platform Teams.

* Mechanism for face-to-face attention to the students
-Email and videocalls in Teams.

* Modifications (if they proceed) of the contents to give
-does not proceed.

* Additional bibliography to facilitate the car-learning
-does not proceed.

* Other modifications
-does not proceed.

=== ADAPTATION OF THE EVALUATION ===
* Test already made
Proof XX: [previous Weight 00%] [Weight Proposed 00%]
-does not proceed.

* Pending proofs that keep
Proof XX: [previous Weight 00%] [Weight Proposed 00%]
-- Multioption test (previous weight 100%)(proposed weight 100%): The test will be identical to the one used under regular circumstances. The only difference will be that the students will take the test from their home (instead of in a classroom) using a platform for on-line evaluation.

* Proofs that modify
[previous Proof] => [new Proof]
-does not proceed.

* New proofs
-does not proceed.

* Additional information
-does not proceed.